User Manual

AMAX-1220/1240 Series

Open Frame 2/4-Axis AMONet RS-485 Motion Slave Modules

ADVANTECH

Enabling an Intelligent Planet

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   – Product name and serial number
   – Description of your peripheral attachments
   – Description of your software (operating system, version, application software, etc.)
   – A complete description of the problem
   – The exact wording of any error messages

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

In addition to this User Manual, the package should also include the following items:

■ AMAX-1220/1240 Series: Open Frame Type 2/4-Axis AMONet RS-485 Motion Slave Modules

Contents

Chapter 1

Introduction

This chapter gives an overview of the product features, and specifi-cations for AMAX-1220/1240 Series.

Sections include:

■ Features
■ Specifications

Products in the AMAX-1220/1240 Series are used to increase the number of axes for an AMONet RS-485 distributed motion control network. These extension slave modules connect serially by a simple and affordable Cat.5 LAN cable, reducing the wiring between driver and controller. This is very suitable for highly integrated machine automation applications.

AMAX-1220 and AMAX-1240 support a range of common motor vendors by transfer cable, such as Mitsubishi J3-Super series, Panasonic Minas A4 or A5 type, and Yaskawa Sigma-V.

1.1 Features

- End limit logic is switchable (high or low active)
- Board ID is switchable
- Easily visible LED indicators on board to do diagnosis
- Direct wire to servo drive to save terminal board space while installation
- Max. 6.5 MHz, 4-axis pulse output
- 28 bits counter for incremental encoder
- Horizontal installation for for servo or stepping motor driver
- Suitable for DIN-rail mounting
- Linear & Circular interpolation support for AMAX-1220/1240
- Simultaneously start / stop between modules are supported for AMAX-1220 and AMAX-1240
- Position compare and triggering function is supported for AMAX-1240 by linear interval & table list method

1.2 AMAX-1220 Specification

1.2.1 Axes

Number of Axes	2 Axes	
Driver Output Pulse	Position control Range	-134,217,728 ~ +134,217,728
	Acceleration/ Deceleration	1 to 65,536(16-bits)
	Driver Speed	Max: 5 Mpps Min: 0.1 pps
	Pulse Output Type	Pulse/Direction(1-pulse, 1-direction type) or Up/Down(2-pulse type) or A/B phase
	Counter	Counter1: Command position counter Counter2: Mechanical position counter Counter3: General-purpose deviation counter
	Precision	0.5LSB
	Output Signal Modes	Differential line driving output
	Speed Curve	T/S-curve Acceleration/Deceleration
2~32-Axes Linear Interpolation	Range	-134,217,728 ~ +134,217,728
	Speed	0.1~5Mpps
	Precision	0.5LSB
2-Axes Circular Interpolation	Range	-134,217,728~+134,217,728
	Speed	0.1~5Mpps
	Precision	0.5LSB

1.2.2 Encoder input

Item	Description	
ECA ECB ECZ	Type	Two terminal, opto-isolated
	Encoder Pulse Input Type	Quadrature (A/B phase) or Up/Down (CW/CCW)
	Input voltage	0: (V+ - V-) < $1V_{DC}$ 1: (V+ - V-) > $3.5V_{DC}$
	Max. input voltage	|V+ - V-| < $15V_{DC}$
	Max. input frequency	3MHz x1, x2, x4 (A/B phase only)
	Protection	2,500V Isolation

1.2.3 Pulse/Direction output

Item	Description	
CW\PULS CCW\DIR	Type	Two terminal, opto-isolated
	Output voltage	0 ~ 4 V
	Max. output voltage	4 V_{DC} (1: min $2V_{DC}$, 0: MAX $0.7V_{DC}$) The output voltage will drop depend on the output current
	Max. output frequency	5MHz

1.2.4 Digital input

Item	Description	
ORG LMT+, LMT- INPOS ALM RDY LTC SD DI0 - DI7	Type	One terminal, opto-isolated
	Input voltage	0: Vin < $3V_{DC}$ 1: Vin > $10V_{DC}$
	Input Current	4.2 mA @ 24 V
	Max. Input voltage	30 V_{DC}
	Max. Input delay time	100 µs
	Protection	2,500 V Isolation

1.2.5 Digital output

Item	Description	
BREAK ALMCLR SRVON ERC COMP DO0 - DO7	Type	One terminal, opto-isolated, Current sink (5 ~ 30 V)
	Output voltage	0: Vo < 0.8 V_{DC} 1: Vo <= Vio
	Max. output voltage	30 V_{DC}
	Max. sink current	200 mA per channel
	Max. Output delay time	100 µs (BREAK, ALMCLR, SRVON, ERC) 250 µs (DO0 - DO7)
	Protection	2,500 V Isolation

1.2.6 Simultaneous move signal

Item	Description	
CSTA CSTP	Type	One terminal, opto-isolated, Current sink (5 ~ 30 V)
	Output voltage	0: Vo < 0.8 V_{DC} 1: Vo <= Vio
	Max. output voltage	30 V_{DC}
	Max. sink current	200 mA per channel
	Max. Output delay time	1 µs
	Protection	2,500 V Isolation

1.2.7 General Specification

Item	Description	
Bus Type	AMONet RS-485	
Certifications	CE, FCC Class A	
I/O Connector Type	2*DB26+2*9 pin pluggable connector 2*12 pin pluggable connector	
Dimensions	142 x 104 x 45 mm (5.6" x 4.1" x 1.8")	
Power Consumption	Typical	65 mA @ 24 V
	Max	75 mA @ 24 V
System Power Supply	VS: 24 V_{DC} ± 10%	
Power Supply for Digital Input/ Output	VEX: 10-30 V_{DC}	
Storage Humidity	5~95% RH, non-condensing	
Operating Temperature	0 ~ 65°C	
Storage Temperature	-25 ~ 85°C	

1.3 AMAX-1240 Specification

1.3.1 Axes

Number of Axes	4 Axes	
Driver Output Pulse	Position control Range	-134,217,728 ~ +134,217,728
	Acceleration/ Deceleration	1 to 65,536 (16-bits)
	Driver Speed	Max: 6.5Mpps Min: 0.1 pps
	Pulse Output Type	Pulse/Direction (1-pulse, 1-direction type) or Up/Down (2-pulse type) or A/B phase
	Counter	Counter1: Command position counter Counter2: Mechanical position counter Counter3: Deflection counter
	Precision	0.5LSB
	Output Signal modes	Differential line driving output
	Speed Curve	T/S-curve Acceleration/Deceleration
2~4-Axes Linear Interpolation	Range	-134,217,728 ~ +134,217,728
	Speed	0.1 ~ 6.5 Mpps
	Precision	0.5 LSB
2-Axes Circular Interpolation	Range	-134,217,728 ~ +134,217,728
	Speed	0.1 ~ 6.5 Mpps
	Precision	0.5 LSB

1.3.2 Encoder input

Item	Description	
ECA ECB ECZ	Type	Two terminal, opto-isolated
	Encoder Pulse Input Type	Quadrature (A/B phase) or Up/Down (CW/CCW)
	Input voltage	0 (V+ - V-) < 1 V_{DC} 1: (V+ - V-) > 3.5 V_{DC}
	Max. input voltage	|V+ - V-| < 15 V_{DC}
	Max. input frequency	3 MHz x1, x2, x4 (A/B phase only)
	Protection	2,500 V Isolation

1.3.3 Pulse/Direction output

Item	Description	
CW\PULS CCW\DIR	Type	Two terminal, opto-isolated
	Output voltage	0 ~ 4 V
	Max. output voltage	4 V_{DC} (1: min 2 V_{DC}, 0 MAX 0.7 V_{DC}) The output voltage will drop depend on the output current
	Max. output frequency	6.5 MHz

1.3.4 Digital input

Item	Description	
ORG LMT+, LMT- INPOS ALM RDY LTC SD	Type	One terminal, opto-isolated
	Input voltage	0: Vin < 3 V_{DC} 1: Vin > 10 V_{DC}
	Input Current	4.2 mA @ 24 V
	Max. Input voltage	30 V_{DC}
	Max. Input delay time	100 µs
	Protection	2,500 V Isolation

1.3.5 Digital output

Item	Description	
BREAK ALMCLR SRVON ERC COMP	Type	One terminal, opto-isolated, Current sink (5 ~ 30 V)
	Output voltage	0: Vo < 0.8 V_{DC} 1: Vo <= Vio
	Max. output voltage	30 V_{DC}
	Max. sink current	200 mA per channel
	Max. Output delay time	1 µs for COMP. 100 µs for BREAK, ALMCLR, SRVON, ERC.
	Protection	2,500 V Isolation

1.3.6 Simultaneous move signal

Item	Description	
CSTA CSTP	Type	One terminal, opto-isolated, Current sink (5 ~ 30 V)
	Output voltage	0: Vo < 0.8 V_{DC} 1: Vo <= Vio
	Max. output voltage	30 V_{DC}
	Max. sink current	200 mA per channel
	Max. Output delay time	1 µs
	Protection	2,500 V Isolation

1.3.7 General Specification

Item	Description	
Bus Type	AMONet RS-485	
Certifications	CE, FCC Class A	
I/O Connector Type	4*DB26+2*16pin pluggable connector	
Dimensions	142 x 104 x 45 mm (5.6" x 4.1" x 1.8")	
Power Consumption	Typical	75mA @ 24V
	Max	80mA @ 24V
System Power Supply	VS: 24 V_{DC} ± 10%	
Power Supply for Digital Input/ Output	VEX: 10-30 V_{DC}	
Storage Humidity	5~95% RH, non-condensing	
Operating Temperature	0 ~ 65°C	
Storage Temperature	-25 ~ 85°C	

Chapter 2

Hardware Functionality

This chapter shows the hardware functionality of AMAX-1220/1240 Series.

Sections include:

- PCB Board Layout
- Power Connector
- AMONet Interface
- BoardID Switch
- Configuration Setting
- LED Definition
- Pin Definition
- Signal Connection
- Field Wiring Considerations

2.1 PCB Board Layout

2.1.1 AMAX-1220 PCB Layout & Pin Assignment
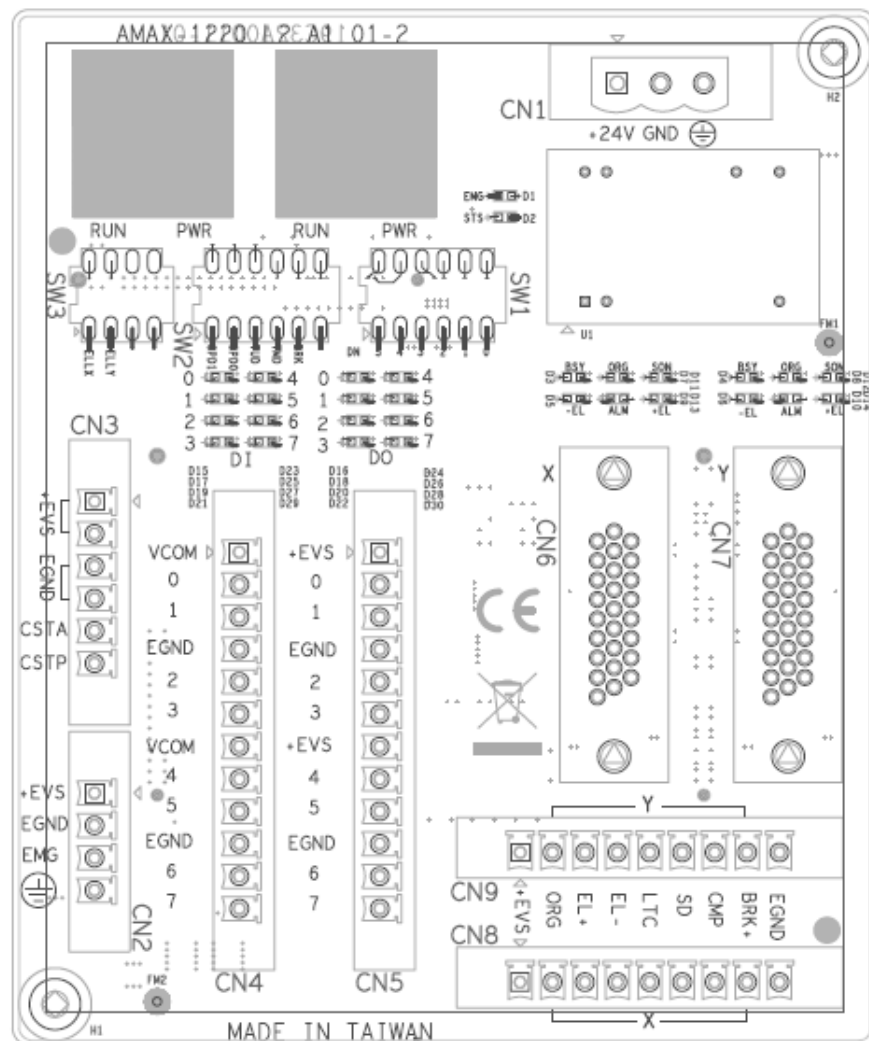
Figure 2.1 PCB Layout of AMAX-1220

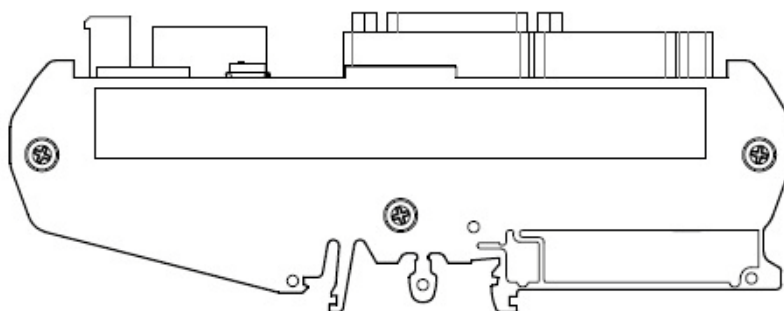**Figure 2.2 Top View of AMAX-1220**

Figure 2.3 Middle View of AMAX-1220

Note! *The height does not include the male connector. The height of male connector is 9mm*
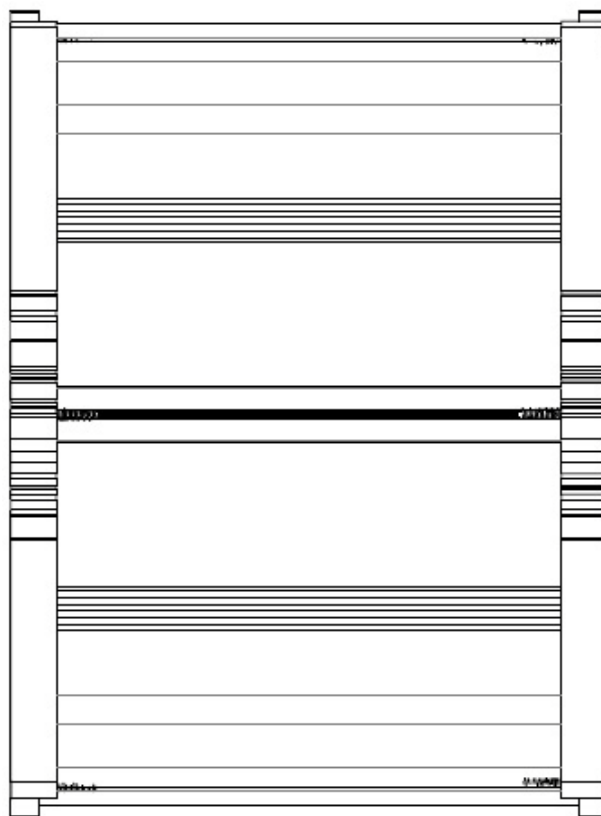
Figure 2.4 Bottom View of AMAX-1220

Figure 2.5 Side View of AMAX-1220

For Connectors

Name	Description
CN1	Module Power
CN2	External Power and EMG Input
CN3	Sharing External Power and CSTA, CSTP Input
CN4	12 pin pluggable connector
CN5	12 pin pluggable connector
CN6	DB26 Connector for X axis
CN7	DB26 Connector for Y axis
CN8	9 pin pluggable connector for X axis
CN9	9 pin pluggable connector for Y axis
SW1	Board ID Switch
SW2	Configuration Setting
SW3	Configuration Setting

For LED indicators

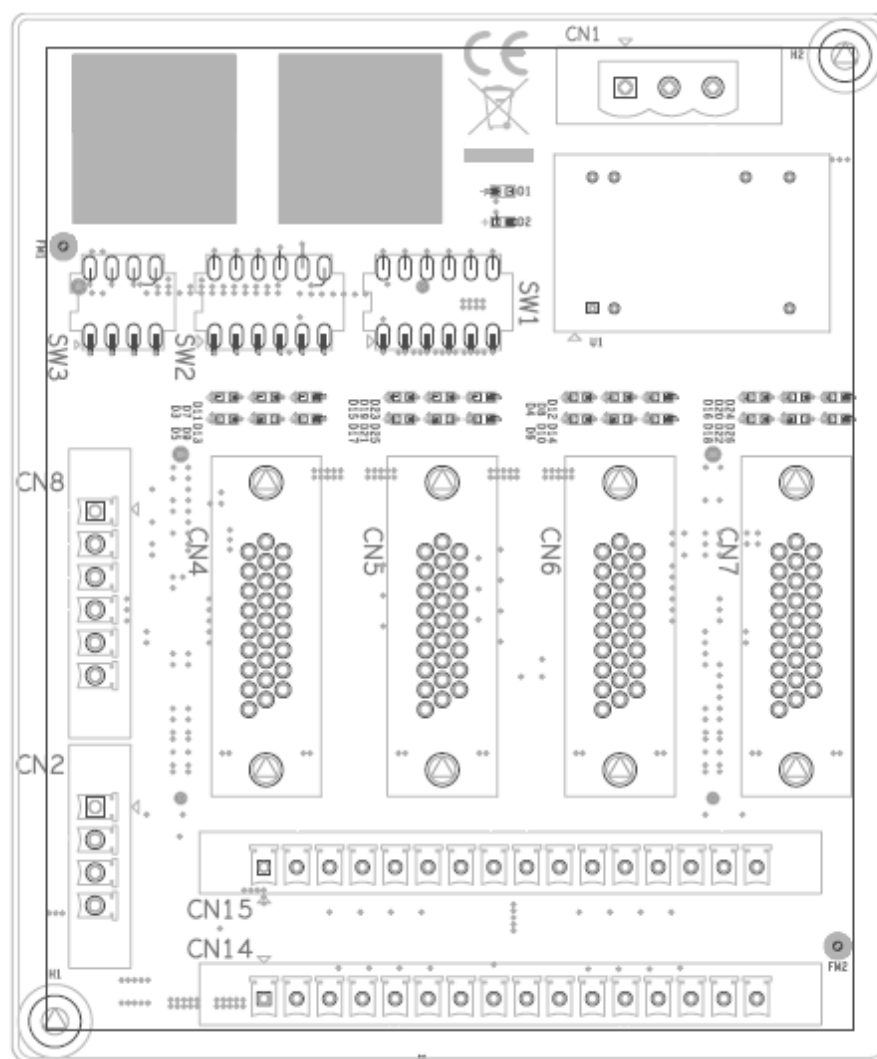| Name	Description
PWR	Power LED
RUN	Communication LED
EMG	Emergency Stop LED
STS	Communication Status LED
BSY	Busy LED for n Axis
ORG	Origin LED for n Axis
SON	Servo On LED for n Axis
LMT-	Negative End Limit LED for n Axis
ALM	Alarm LED for n Axis
LMT+	Positive End Limit LED for n Axis

2.1.2 AMAX-1240 Label Assignment

Figure 2.6 PCB Layout of the AMAX-1240 L2
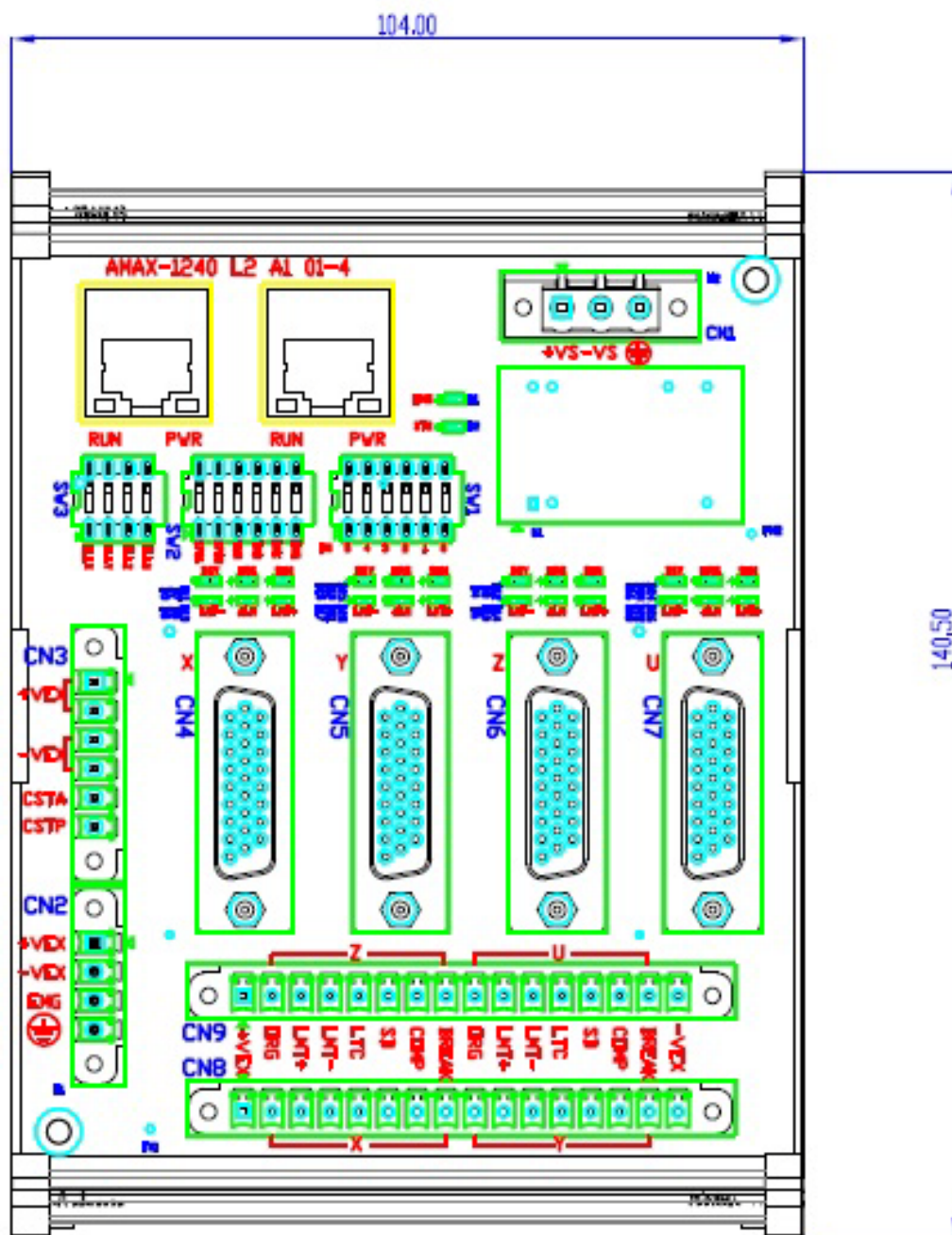
Figure 2.7 Top View of AMAX-1240 L2
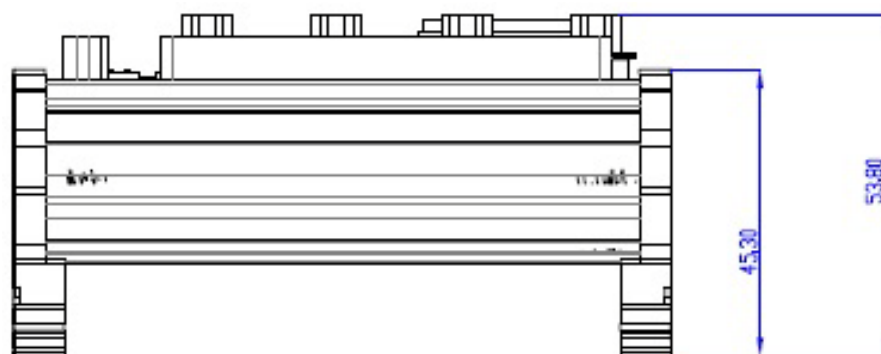
Figure 2.8 Middle View of AMAX-1240 L2

> **Note!** *The height does not include the male connector. The height of male connector is 9mm*
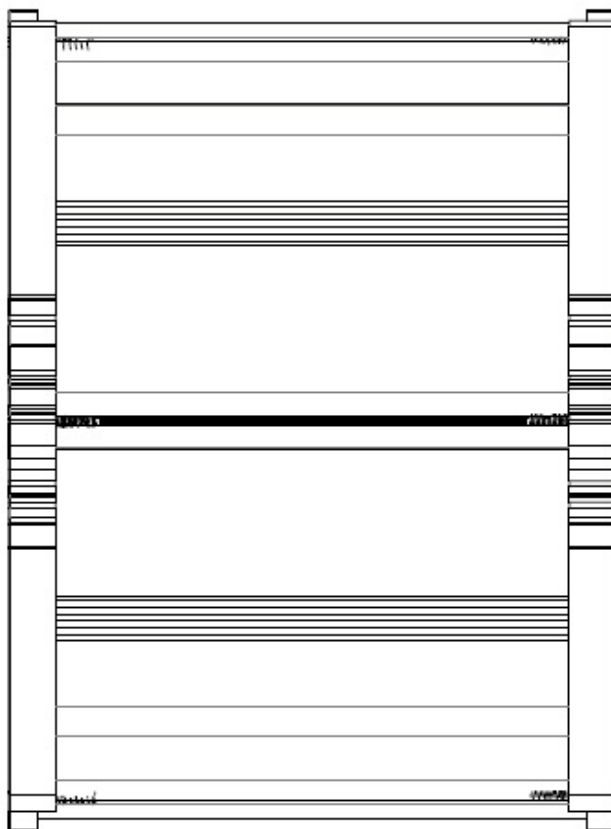
Figure 2.9 Bottom View of AMAX-1240 L2
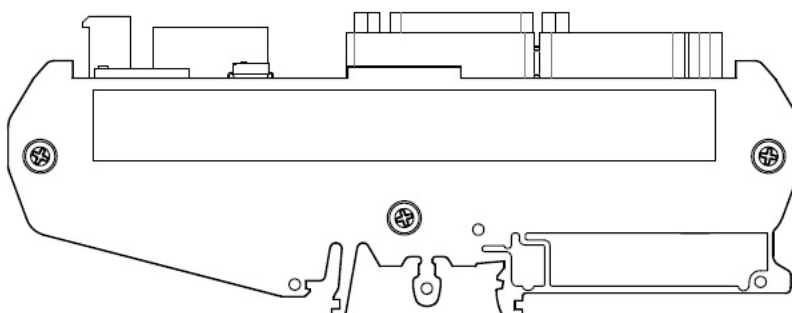
Figure 2.10 Side View of AMAX-1240 L2

For Connectors

Name	Description
CN1	Module Power
CN2	External Power and EMG Input
CN3	Sharing External Power and CSTA, CSTP Input
CN4	DB26 Connector for X axis
CN5	DB26 Connector for Y axis
CN6	DB26 Connector for Z axis
CN7	DB26 Connector for U axis
CN8	16 pin pluggable connector for X and Y axis
CN9	16 pin pluggable connector for Z and U axis
SW1	Board ID Switch
SW2	Configuration Setting
SW3	Configuration Setting

For LED indicators

Name	Description
PWR	Power LED
RUN	Communication LED
EMG	Emergency Stop LED
STS	Communication Status LED
BSY	Busy LED for n Axis
ORG	Origin LED for n Axis
SVON	Servo On LED for n Axis
LMT-	Negative End Limit LED for n Axis
ALM	Alarm LED for n Axis
LMT+	Positive End Limit LED for n Axis

2.2 Power Connector

2.2.1 Module Power Connector (CN1)
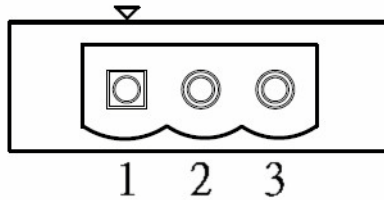
Table 2.1: Module Power Connector (CN1)			
Pin	Name	Type	Pin description
1	+VS	Power	+24V power input
2	-VS	Power	Power ground
3	VE_GND	Power	External earth ground

2.2.2 External Power Connector (CN2)
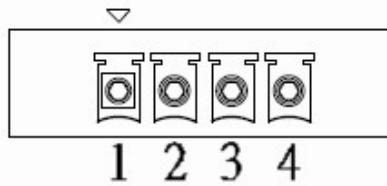
Table 2.2: External Power Connector (CN2)			
Pin	Name	Type	Pin description
1	+VEX	Power	External +24V power input
2	-VEX	Power	External power ground
3	EMG	In	Isolated digital input
4	VE_GND	Power	External earth ground

2.3   AMONet Interface

2.3.1   AMONet Extension
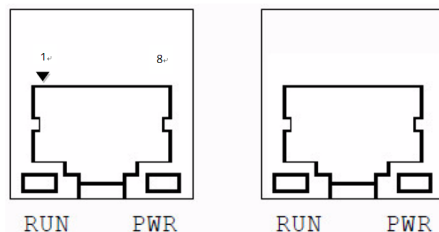
Pin	Label	Description
Table 2.3: AMONet Extension		
1	FG	Field Ground
2	FG	Field Ground
3	RS485+	High Speed RS-485 protocol
4	FG	Field Ground
5	FG	Field Ground
6	RS485-	High Speed RS-485 protocol
7	FG	Field Ground
8	FG	Field Ground
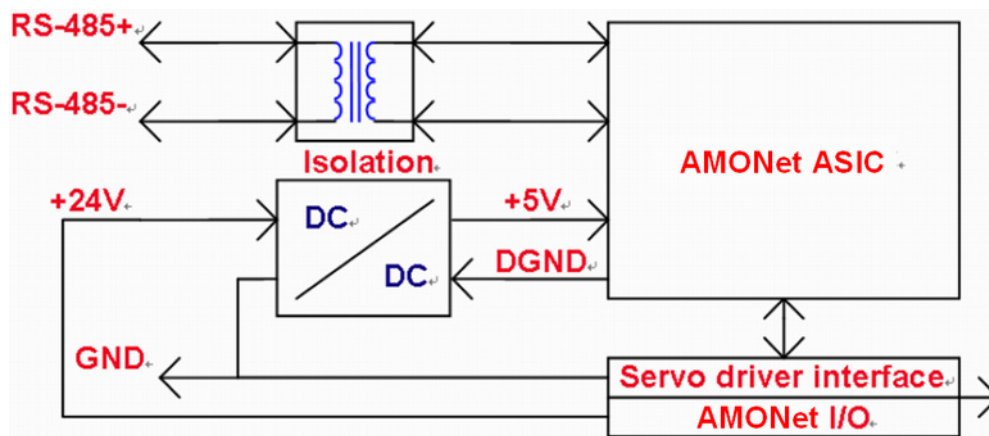
Figure 2.11 RS-485 Extension Port

2.3.2 Terminal Resistor
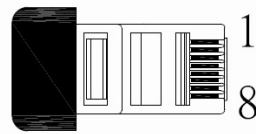
Table 2.4: Terminal Resistor	
	PIN
100Ω 1/4W Resistor	3
	6

Note!   *Terminal Resistor is used for the last module only.*

2.4 Board ID Setting (SW1)

SW1 is used to assign the ID occupation in network. AMAX-1240 will ONLY occupy 1 ID by node number setting, but AMAX-1220 will occupy 4 consecutive ID by node number setting.

Take AMAX-1240 as example. If Pin 1 to Pin 4 are OFF, but Pin 5 & 6 are ON, the node number is 3. Then, AMAX-1240 board ID is 3 and only occupies this address.

Take AMAX-1220 as example. If Pin 1 to 3 are OFF, but Pin 4 is ON, the node number is 4 (Please see Note 2). Then, AMAX-1220 board ID will occupy 4,5,6,7 as consecutive sequence. Other AMAX device shall avoid to occupy these 4 board ID.

Assume your system uses one AMAX-1220 and one AMAX-1240. And, your node number is assigned as the above case. Then, the ID occupation would be 3,4,5,6,7, and the other ID would be empty for other AMAX devices.

Table 2.5: Board ID Setting (SW1)				
	Pin	**Label**	**ON**	**OFF**
	1	DN5	1	0
	2	DN4	1	0
	3	DN3	1	0
	4	DN2	1	0
	5	DN1	1	0
	6	DN0	1	0

Note 1!   *Node Number=32xDN5+16xDN4+8xDN3+4xDN2+2xDN1+DN0.*

Default Setting: All the switches are in OFF status. AMAX-1240 needs 6 digits to set up the board ID.

Note 2!   *AMAX-1220 ONLY needs first 4 pins to set up the board ID. Shortly, pin 5 and pin 6 ARE NOT available to use. Only use pin 1 to 4 to set up.*

2.5 Communication Protocol Baud Rate Setting (SW2)

Swtich	Label	Description
1	SPD1	Baud-Rate Setting
2	SPD0	
3	TUD	Time-Out Status Latch
4	TMD	Specify watchdog timer time
5	BRK	*For internal use only, please keep in OFF
6	EMG	Emergency stop control

2.5.1 Baud-Rate Setting

SPD1	SPD0	
OFF	OFF	20 MHz
OFF	ON	10 MHz
ON	OFF	5 MHz
ON	ON	2.5 MHz

2.5.2 TUD

This terminal is used to set output conditions when the watchdog timer times out.	
OFF	The output keeps its current status.
ON	The output is Reset.

2.5.3 TMD

When the interval between data packets sent from a master card (ex. PCI-1202U) is longer than the specified interval, the watchdog timer times out.

	20 Mbps	10 Mbps	5 Mbps	2.5 Mbps
OFF	20 ms	40 ms	80 ms	160 ms
ON	5 ms	10 ms	20 ms	40 ms

2.5.4 EMG

This terminal is used to set input conditions when the emergency stops occurrence.	
OFF	High active
ON	Low active.

2.6 End Limit Logic Setting (SW3)

For AMAX-1220

Pin	Name	Type	Pin description
1	ELLX	IN	ON: High active OFF: Low active
2	ELLY	IN	ON: High active OFF: Low active
3	NC		
4	NC		

For AMAX-1240

Pin	Name	Type	Pin description
1	ELLX	IN	ON: High active OFF: Low active
2	ELLY	IN	ON: High active OFF: Low active
3	ELLZ	IN	ON: High active OFF: Low active
4	ELLU	IN	ON: High active OFF: Low active

2.7 LED Definition

For AMAX-1220 & AMAX-1240

Name	Axis	Pin Description
PWR		Power
RUN		Communication
STS		Communication Status
EMG		Emergency Stop
BSY	ALL	Busy status for n Axis
ORG	ALL	Origin status for n Axis
SVON	ALL	Servo On status for n Axis
LMT-	ALL	Negative End Limit status for n Axis
ALM	ALL	Alarm status for n Axis
LMT+	ALL	Positive End Limit status for n Axis

2.8 Motion Control Connector Pin Definition (CN3 to CN9)

2.8.1 External Power Connection and Simultaneous Move Signal (CN3)
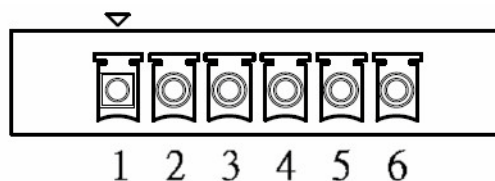
Pin	Name	Type	Pin description
Table 2.6: External Power Connection and Simultaneous Move Signal (CN3)			
1	+VEX	Power	External +24V power input
2	+VEX	Power	External +24V power input
3	-VEX	Power	External power ground
4	-VEX	Power	External power ground
5	CSTA	In/Out	Isolated digital input port
6	CSTP	In/Out	Isolated digital input port

2.8.2 Servo Drive Interface

For AMAX-1220, CN6 and CN7 are used. For AMAX-1240, CN4 to CN 7 are used. They are common in DB26 connector type.
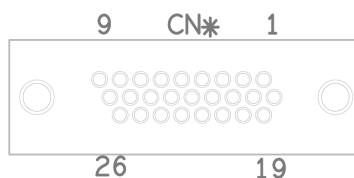
Table 2.7: Servo Drive Interface

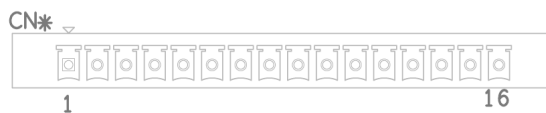| Pin	Name	Axis	Type	Pin Description
1	SRVON	All	Out	Servo ON output
2	INPOS	All	In	Servo in position input
3	ERC	All	Out	Servo counter clear output
4	RDY	All	In	Servo ready input
5	CW- / PULS-	All	Out	Pulse command differential output - 1.Pulse+ output in 2 pulse mode 2.Pulse output in pulse/direction mode
6	CW+ / PULS+	All	Out	Pulse command differential output + 1.Pulse+ output in 2 pulse mode 2.Pulse output in pulse/direction mode
7	ECA-	All	In	Encoder differential input - 1.Phase A input in AB phase mode 2.Pulse+ input in 2 pulse mode 3.Pulse input in pulse/direction mode
8	ECA+	All	In	Encoder differential input + 1.Phase A input in AB phase mode 2.Pulse+ input in 2 pulse mode 3.Pulse input in pulse/direction mode
9	BREAK	All	Out	Motor BREAK input
10	ALMCLR	All	Out	Servo alarm clear
11	ALM	All	In	Servo alarm input
12	+VEX	All	Power	External +24V power input
13	-VEX	All	Power	External power ground
14	-VEX	All	Power	External power ground
15	-VEX	All	Power	External power ground
16	ECB-	All	In	Encoder differential input - 1.Phase B input in AB phase mode 2.Pulse- input in 2 pulse mode 3.Direction input in pulse/direction mode
17	ECB+	All	In	Encoder differential input - 1.Phase B input in AB phase mode 2.Pulse- input in 2 pulse mode 3.Direction input in pulse/direction mode
18	-VEX	All	Power	External power ground
19	EMG	All	In	Emergency stop input for all axis
20	-VEX	All	Power	External power ground
21	-VEX	All	Power	External power ground
22	-VEX	All	Power	External power ground
23	CCW+ / DIR+	All	Out	Pulse command differential output - 1.Pulse- output in 2 pulse mode 2.Direction output in pulse/direction mode
24	CCW- / DIR-	All	Out	Pulse command differential output + 1.Pulse- output in 2 pulse mode 2.Direction output in pulse/direction mode
25	ECZ+	All	In	Encoder index differential input -
26	ECZ-	All	In	Encoder index differential input +

2.8.3 Mechanical I/O Interface

For AMAX-1220, CN8 and CN9 are defined as follows with TB9 connector type.

Pin	Name	Axis	Type	Pin Description
1	+VEX	All	Power	External +24V power input
2	ORG	All	In	Home input / General input 3
3	LMT+	All	In	+Direction limit input
4	LMT-	All	In	-Direction limit input
5	LTC	All	In	Encoder counter position latch
6	SD	All	In	Slow down velocity
7	COMP	All	Out	Encoder compare output
8	BREAK	All	Out	Motor BREAK input
9	-VEX	All	Power	External power ground

For AMAX-1240, CN8 and CN9 are defined as follows with TB16 connector type.

Pin	Name	Axis	Type	Pin Description
1	+VEX	All	Power	External +24V power input
2	ORG	X,Z	In	Home input
3	LMT+	X,Z	In	+Direction limit input
4	LMT-	X,Z	In	-Direction limit input
5	LTC	X,Z	In	Encoder counter position latch
6	SD	X,Z	In	Slow down velocity
7	COMP	X,Z	Out	Encoder compare output
8	BREAK	X,Z	Out	Motor BREAK input
9	ORG	Y,U	In	Home input
10	LMT+	Y,U	In	+Direction limit input
11	LMT-	Y,U	In	-Direction limit input
12	LTC	Y,U	In	Encoder counter position latch
13	SD	Y,U	In	Slow down velocity
14	COMP	Y,U	Out	Encoder compare output
15	BREAK	Y,U	Out	Motor BREAK input
16	-VEX	All	Power	External power ground

2.8.4 Extra General Purpose Input & Output (ONLY available for AMAX-1220 model)

The extra general purpose input and output are defined in CN4 & CN5 of AMAX-1220 with TB12 connector type.

Table 2.8: CN4				
Pin	**Name**	**Axis**	**Type**	**Pin Description**
1	VCOM		Power	External common power input
2	DI0		In	Isolated digital input
3	DI1		In	Isolated digital input
4	-VEX		Power	External power ground
5	DI2		In	Isolated digital input
6	DI3		In	Isolated digital input
7	VCOM		Power	External common power input
8	DI4		In	Isolated digital input
9	DI5		In	Isolated digital input
10	-VEX		Power	External power ground
11	DI6		In	Isolated digital input
12	DI7		In	Isolated digital input

Table 2.9: CN5				
Pin	**Name**	**Axis**	**Type**	**Pin Description**
1	+VEX		Power	External +24V power input
2	DO0		Out	Isolated digital output
3	DO1		Out	Isolated digital output
4	-VEX		Power	External power ground
5	DO2		Out	Isolated digital output
6	DO3		Out	Isolated digital output
7	+VEX		Power	External +24V power input
8	DO4		Out	Isolated digital output
9	DO5		Out	Isolated digital output
10	-VEX		Power	External power ground
11	DO6		Out	Isolated digital output
12	DO7		Out	Isolated digital output

2.9   Motion Signal Connection

2.9.1   Digital Input

This includes ORG, LMT+, LMT-, LTC, SD, ALM, INPOS, RDY and EMG signals.
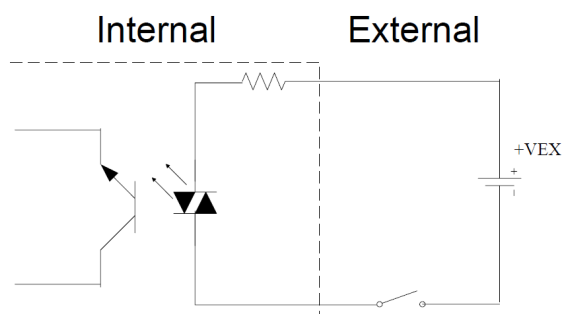
Home Position

Table 2.10: ORG Pins	
Label	**Description**
ORG	ORG Input

End Limit

Table 2.11: LMT+ and LMT- Pins	
Label	**Description**
LMT+	Plus End Limit
LMT-	Minus End Limit

Position Latch Signal

Table 2.12: LTC Pins	
Label	**Description**
LTC	Latch counter Input

Slow Down Signal

Table 2.13: SD Pins	
Label	**Description**
SD	Slow down Signal

Servo Alarm

Table 2.14: ALM Pins	
Label	**Description**
ALM	Servo Alarm Input

Servo In position

Table 2.15: INP Pins	
Label	**Description**
INPOS	Servo In position Input

Servo Ready

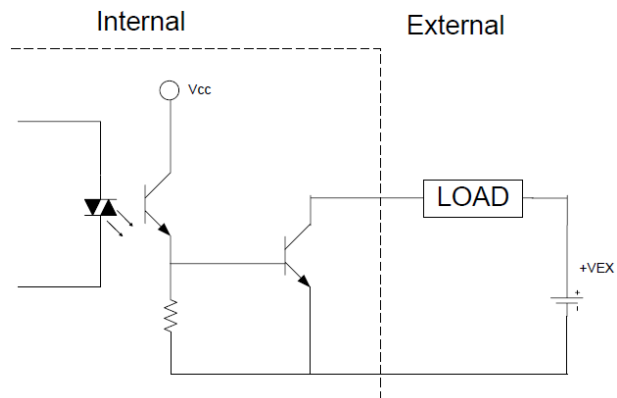| Table 2.16: RDY Pins	
Label	**Description**
RDY	Servo Ready Input

Emergency Stop

Table 2.17: EMG Pins	
Label	**Description**
EMG	Emergency Stop

2.9.2 Digital Output

This includes COMP, BREAK, SRVON, ERC and ALMCLR signals.

Position Compare for Trigger Output

Table 2.18: CMP Pins	
Label	**Description**
COMP	Compare Output

Servo Break

BREAK is an output signal for servo break. It has two different operating modes.

Single mode: In this type, this digital output pin is the same as SRVON and ERC that has a specific output function.

Auto mode: This mode can make this pin automatically changed its status followed by SRVON.

Table 2.19: BREAK Pins	
Label	**Description**
BREAK	Break Signal Output

Servo On

Table 2.20: SVON Pins	
Label	Description
SRVON	Servo On control output

Reset Driver Error counter/Deviation Counter Clear

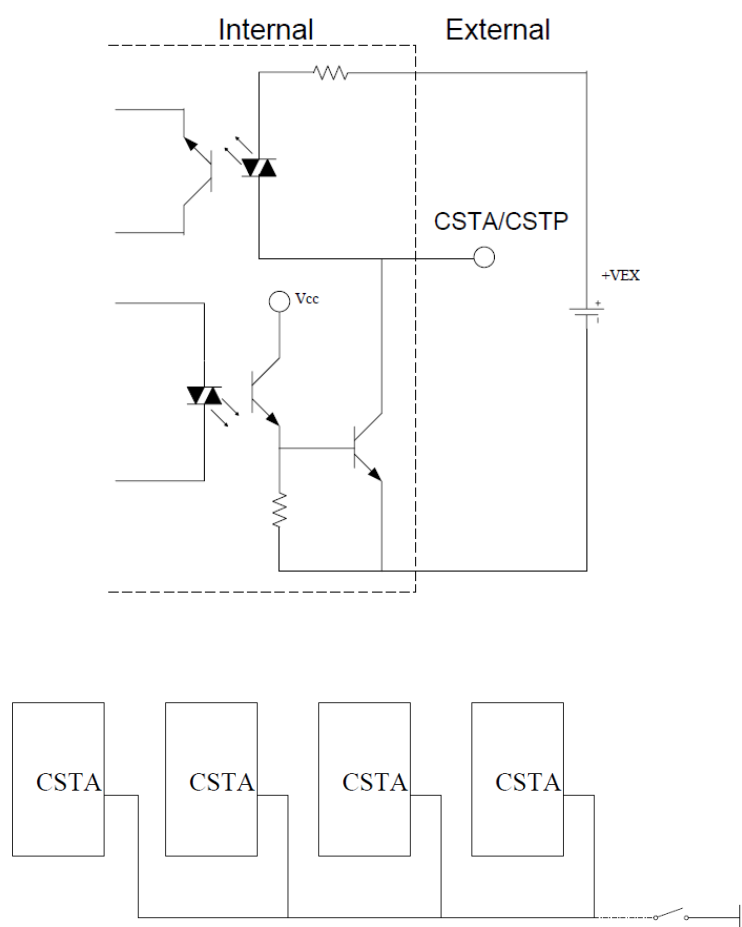| Table 2.21: ERC Pins	
Label	Description
ERC	Reset Drive Error Counter

Reset Servo Alarm

Table 2.22: RALM Pins	
Label	Description
ALMCLR	Reset Servo Alarm

2.9.3 Digital Bi-direction Simultaneously Move Signal

CSTA (Concurrent Start)

This pin is contained input and output. The model will under waiting status until this pin get a low signal. The DDA pulse will send.

CSTA/CSTP module connections are up to 8 modules at maximum. In shorts, in the AMONET network (in one ring), no matter AMAX-1240 using CSTA/CSTP or AMAX-1220 using CSTA/CSTP, there are totally 8 modules in maximum.
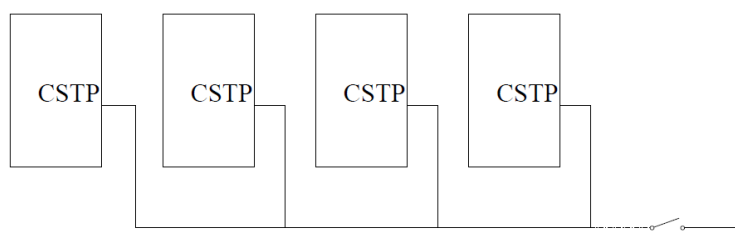
Table 2.23: CSTA Pins	
Label	**Description**
CSTA	CSTA Signal Port

Note! *The CSTA of AMAX-1240 and AMAX-1220 ARE NOT allowed to mutually connect with each other. Shortly say, if multiple AMAX-1220 are required to perform simultaneously move, then, connect CSTA signal of each AMAX-1220 modules. if multiple AMAX-1240 are required to perform simultaneously move, then, connect CSTA signal of each AMAX-1240 modules. But, both of CSTA signal are not allowed to connect.*

CSTP (Concurrent Stop)

This pin can command the slave model stop running and it has ability to make other model terminate working.

Table 2.24: CSTP Pins	
Label	**Description**
CSTP	CSTP Signal Port

Note! *The CSTP of AMAX-1240 and AMAX-1220 ARE NOT allowed to mutually connect with each other. Shortly say, if multiple AMAX-1220 are required to perform simultaneously move, then, connect CSTP signal of each AMAX-1220 modules. if multiple AMAX-1240 are required to perform simultaneously move, then, connect CSTP signal of each AMAX-1240 modules. But, both of CSTP signal are not allowed to connect.*

2.9.4 Pulse Output Signal

OUT and DIR (Pulse Train Output Control)

Table 2.25: DDA Pulse Pins	
Label	**Description**
CW+/PULS+	CW+ / Pulse Output+
CW-/PULS-	CW- / Pulse Output-
CCW+/DIR+	CCW+ / Direction Output+
CCW-/DIR-	CCW- / Direction Output-

Encoder Feedback Signal

Table 2.26: Encoder Pins	
Label	**Description**
ECA+	Encoder A (+)
ECA-	Encoder A (-)
ECB+	Encoder B (+)
ECB-	Encoder B (-)
ECZ+	Encoder Z (+)
ECZ-	Encoder Z (-)

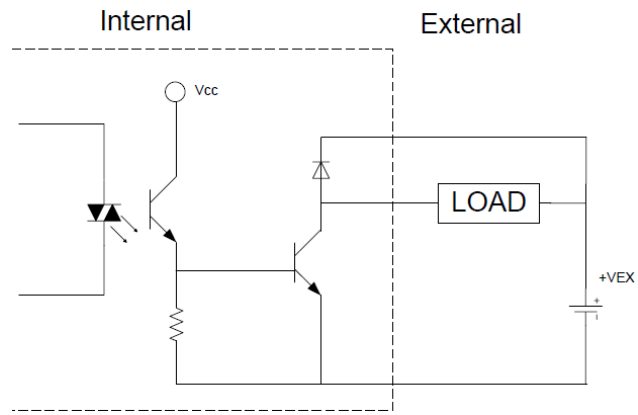### 2.9.5 Extra General Purpose Input & Output (ONLY available for AMAX-1220 model)
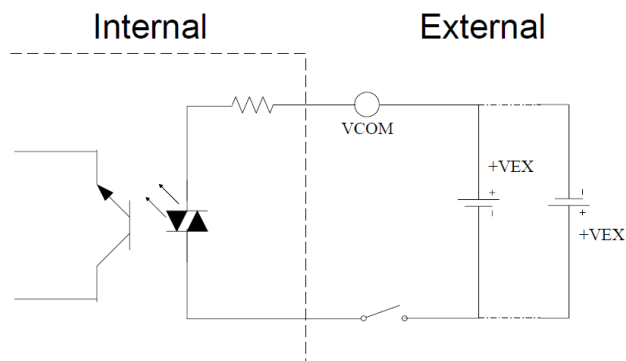
DI0~DI7

These ports can have the outer digital signal and send to master card through AMONet.

Table 2.27: IDIx Pins	
Label	**Description**
DI0~DI7	General Purpose Digital Output

DO0~DO7

These ports can be control by master card and it can connect relay, SCR and so on.

Table 2.28: IDOx Pins	
Label	**Description**
DO0~DO7	General Purpose Digital Output with diamagnetic diode

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